

To: Distribution
From: Jerold C. Whitmore
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Subject: Reporting Process Access Mode to the User

I. Introduction

There are three commonly used hcs_ primitives which attempt to return the caller's mode of access to a branch. Today, this mode is the raw mode from the ACL of the branch. The raw mode currently can be misleading to the user since it does not account for ring brackets.

The Access Isolation Mechanism will make the raw ACL mode even more misleading to the user. The following changes to the three primitives are proposed to provide the user process with mode information which is both correct and upward compatible with existing software.

II. hcs_\$star_list_

This primitive returns a structure containing a mode field for each branch which matches the star name. There is no field in the structure for ring bracket data. Therefore, the user would have to make a separate call to properly determine his access.

The mode returned in this structure should be changed to the user's effective mode at his current validation level. The effective mode would be a combination of ACL mode, ring brackets and Access Isolation restrictions all factored together.

This will ensure that programs which make decisions based on the mode data in the structure will work correctly. If these programs already obtain the ring bracket data to properly determine access, they will still get the same answer, but also consistent with the Access Isolation Mechanism. Hence, this change is upward compatible.

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Programs which report the mode data in the structure to the user (e.g., the list command) will now report the correct mode for the process at his current validation level. More detailed access information will still be available to the process through other primitives or by the use of commands.

III. hcs_\$status_

This primitive returns a structure for a specified branch. The structure contains the caller's raw ACL mode without factoring in the ring brackets or returning the ring bracket data.

The mode returned in this structure should also be changed to the effective mode as described above. This change will also be upward compatible for the same reasons.

IV. hcs_\$status_long

This primitive also returns a structure for a specified branch. The structure contains both mode and ring bracket fields. Before the addition of the Access Isolation Mechanism, this data was sufficient for the user to determine his access to the branch. Now this is not the case. The size of the structure does not provide space for the branch access class to be included and the length cannot be increased for compatibility reasons.

Therefore, the mode data currently returned should also be changed to the caller's effective mode. In addition, the 13 bit pad field of the structure can be changed to provide the raw ACL mode (this will leave an 8 bit pad). The raw mode data will be useful for status reporting (e.g., in the status command).

This change is also upwards compatible for programs making decisions based on access data and programs which need the raw ACL mode can be trivially modified to use it.

V. Other hcs_ primitives

The primitive hcs_\$fs_get_mode returns the caller's effective mode at his current validation level. The effective mode will still be returned, but with the Access Isolation restrictions factored in.

The primitive hcs_\$status is not called by any system software. It returns directory information in a packed structure. This primitive is not a documented user interface and should be deleted.

The primitive `hcs_$list_dir` is only used by `backup_dump_recurse`. The mode returned in its packed structure is thus backup's mode to the branch. Since backup is running in ring 1 when it calls `hcs_$list_dir`, it can believe the mode data for segment branches. The mode is not currently used for access decisions by backup. However, for consistency, the mode should have the Access Isolation restrictions factored in. This will help to avoid mis-interpretation in future changes or in other programs which may be designed to call this primitive.

VI. Note on Compatibility

These changes have been designed to properly integrate the Access Isolation Mechanism into existing primitives and to minimize the impact on current user software. For installations operating at a single access class, the changes will be invisible except for ring bracket factoring. At all installations, the information returned by the primitives will be correct and complete.

Programs which report or save information about branch status must be changed eventually to include the branch access class. The returned structures mentioned in this MTB will not be changed to include this data for compatibility reasons. New primitives will be provided for this purpose.

If these changes cause major problems for any user, please call:

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